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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

KALAFUT, STEPHEN J

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 09/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/931,943

Applicant(s)

SHCHORI ET AL.

Examiner

Stephen J. Kalafut

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-76 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,6 and 37-76 is/are rejected.
- 7) ☒ Claim(s) 2-5 and 7-36 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>(2 dates)</u> . | 6) <input type="checkbox"/> Other: ____ |

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The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(c) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 39-57, 59-64, 66 and 70-76 are rejected under 35 U.S.C. 102(b) as being anticipated by Nitzan (US 5,652,043).

These claims are either in product-by-process format, or contain recitations of how the present separator was made ("self-form"), which are treated under product-by-process practice. These claims are thus considered for the structure they imply rather than for the process steps. See MPEP 2113. Nitzan discloses a cell which includes an anode such as zinc powder, a cathode such as MnO_2 powder (column 2, lines 39-42), and a third layer between them, which includes a polymer, an electroactive material, and a deliquescent material (column 2, lines 22-31). The polymer may be at least one of polyvinyl alcohol, polyacrylic acid, polyvinylpyrrolidone, polyethylene oxide, agarose, starch and hydroxyethylcellulose, the last three of these being polysaccharides (column 3, lines 13-18). Zinc chloride may be used as both the electroactive material and the deliquescent material (column 8, lines 5-8). The cathode may also include carbon powder (column 8, lines 14-16). Since ZnCl_2 and some of the present polymers are disclosed, the presently recited functions of ZnCl_2 , and its interactions with the polymers, would

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inherently accrue. The polymer-containing electrolytes of Nitzan would be the same as those implied by the present claims, even though the process of forming them may not be the same.

Nitzan also discloses terminals in contact with the electrodes (column 6, lines 54-59).

Claims 1, 6, 37, 39, 40, 45 and 76 are rejected under 35 U.S.C. 102(b) as being anticipated by Moser (US 3,660,163).

Moser discloses a battery made by contacting a lithium anode and an iodine cathode, resulting in a self-formed electrolyte layer between them, from a chemical reaction between the two electrodes, which produces LiI (column 1, lines 40-47). The electrodes each include a current collector (column 1, lines 62-66). This electrolyte would be an interfacial separator. Thus, Moser discloses the present process, as well as the resulting product, of these claims.

Claims 39-48, 63, 65 and 66 are rejected under 35 U.S.C. 102(b) as being anticipated by Dixon *et al.* (US 4,834,772).

Dixon *et al.* disclose a cell with an electrolyte including the polysaccharide chitosan, which is gelled and crosslinked, and which is coated onto one or both of the electrodes (column 2, lines 54-61). Thus, the cell would have the structure implied by these product claims, even though the process of forming it may not be the same as presently recited.

Claims 39, 40, 45-47, 63 and 65 are rejected under 35 U.S.C. 102(b) as being anticipated by Manganaro *et al.* (US 5,155,144).

Manganaro *et al.* disclose a battery separator made of a polysaccharide (column 2, lines 45-51) such as crosslinked chitosan, or mixtures of such polysaccharides (column 6, lines 62-68). The separator is used with anodes and cathodes (column 2, lines 63-64). Thus, the cell would have the structure implied by these product claims, even though the process of forming it may not be the same as presently recited.

Claims 39, 40, 47, 49 and 60 are rejected under 35 U.S.C. 102(b) as being anticipated by Denton (US 5,962,168).

Denton discloses a battery in which a polymer electrolyte (26) is disposed between two electrodes (12, 14) and thus forms an interfacial separator. The electrolyte may be a mixture of two or more polymers, including polyvinylpyrrolidone (column 4, lines 22-31). This would be the same structure as one resulting from the physical interaction of two polymers. Thus, the cell would have the structure implied by these product claims, even though the process of forming it may not be the same as presently recited.

Claims 39, 40, 49-51 and 54 are rejected under 35 U.S.C. 102(a) and (e) as being anticipated by Kolb *et al.* (US 6,080,282).

Kolb *et al.* disclose a cell including a gelled polyethylene oxide electrolyte (28) between two electrodes (32, 40), and which also includes poly methyl methacrylate (column 3, lines 29-34). See also column 4, line 55 through column 5, line 14. The electrolyte would thus be the result of a physical interaction between the two polymers. A polymerization initiator may also

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be present (column 4, lines 50-54). Thus, the cell would have the structure implied by these product claims, even though the process of forming it may not be the same as presently recited.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 58 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nitzan, *supra*.

This claim differs from Nitzan by reciting carbon within the anode. However, carbon is well known as a conductive additive for battery electrodes. While zinc is a metal, and thus conductive itself, during cell operation, it would oxidize to zinc oxide and thus become less conductive. For these reasons, it would be obvious to include carbon within the anode of Nitzan.

Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moser in view of Nitzan, both *supra*.

This claim differs from Moser in that the terminals are applied by using printing technology. Nitzan teaches printing technology as a preferred way to apply terminals to a cell (column 6, lines 49-54). Because printing would avoid the heat needed to spot-weld the terminal onto the cell, as described by Moser (column 1, lines 62-67), it would be obvious to use printing technology as taught by Nitzan to create the terminals of Moser.

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Claims 2-5 and 7-36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art does not disclose a process of forming a battery, where the electrodes, either with each other or with an optional layer, produce a self-formed separator upon contact, where either the cell is deliquescent, a polymer or gel is formed upon such contact, a physical interaction takes place upon such contact, or either MnO_2 or Zn is one of the electrode materials.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lake (US 5,658,684) discloses a cell with components made by various deposition technologies, including conductive ink deposition.

The disclosure is objected to because of the following informalities: The numerals 78 and 80 are each used to indicate different things in figures 2 and 3. Appropriate correction is required.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J. Kalafut whose telephone number is 571-272-1286.

The examiner can normally be reached on Mon-Fri 8:00 am-4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

sjk



STEPHEN KALAFUT
PRIMARY EXAMINER
GROUP

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